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09/380,864	12/02/1999	MARTYN VINCENT TWIGG	JMYT-V00200	3166

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PAUL F PRESTIA
RATNER & PRESTIA
ONE WESTLAKES BERWYN
SUITE 301 PO BOX 980
VALLEY FORGE, PA 194820980

EXAMINER

LEUNG, JENNIFER A

ART UNIT	PAPER NUMBER
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1764

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Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	Application No. 09/380,864	Applicant(s) TWIGG, MARTYN VINCENT	
	Examiner Jennifer A. Leung	Art Unit 1764	

-- The MAILING DATE of this communication appears on the cover sheet with the corresponding address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>3</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

1. The specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Objections

2. Claims 1 and 5 are objected to because of the following informalities. Appropriate correction is required.

With respect to claim 1, -- , -- should be inserted after "230°C" (line 7), "25,000 hr⁻¹" (line 7) for proper grammatical form and clarity in the claims.

With respect to claim 5. -- , -- should be inserted after "230°C" (line 6), "25,000 hr⁻¹" (line 7) for proper grammatical form and clarity in the claims.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 1-8 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claims 1 and 5 are not enabling as it is unclear as to how the apparatus and method, defined in terms of a desirable catalyst conversion efficiency (at a given test condition), may be

achieved since the claims merely restate the technical problem to be solved and provide no indication of how such desirable properties may be obtained. Although examples are provided in the specification to indicate the relationship of low loading and low space velocity to conversion efficiency of the catalyst (Test 1, Test 2, and Example 1), it is unclear as to how these constructional features are reflected in the claims.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1-8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

With respect to claim 1, "suitable for" (line 1) is considered vague and indefinite. Furthermore, "the hydrocarbon" (lines 7-8) and "propane" (line 12) lack proper positive antecedent basis. Likewise in claim 5, line 7. Furthermore, it is unclear as to what the applicants are attempting to recite by "up-stream" (line 2) and "downstream" (line 3) as no point of reference is stated. Furthermore, the language of the claim is directed to a method limitation which renders the claim vague and indefinite as it is unclear as to what structural elements the applicant is attempting to recite by "and has a ratio of % NO_x conversion..." (lines 5-10) since % conversion, , temperature, space velocity, and input ratio are not elements of the apparatus. Furthermore, a broad limitation together with a narrow limitation that falls within the broad limitation (within the same claim) is considered vague and indefinite as it is unclear as to what limitation the applicants are attempting to recite by "comprising a platinum group metal" (broad limitation, line 3) and "comprises platinum and/or palladium" (narrower limitation, line 5).

Furthermore, it is unclear as to where “systems do not include silver or tungsten” (line 4) is disclosed in the specification.

With respect to claim 2, the language of the claim is directed to a method limitation which renders the claim vague and indefinite as it is unclear as to what structural elements the applicant is attempting to recite by “the exhaust gas flow over the first catalyst...” (lines 2-3) since the exhaust gas and space velocity are not elements of the apparatus. Furthermore, “the exhaust gas” lacks proper positive antecedent basis. Likewise in claim 3, line 2. Furthermore, it is unclear as to what structural limitation is intended by, “so designed and constructed that” (line 1), and where it is disclosed in the specification. Likewise in claim 3, line 1.

With respect to claim 3, the language of the claim is directed to a method limitation which renders the claim vague and indefinite as it is unclear as to what structural elements the applicant is attempting to recite by “the exhaust gas flow over the second catalyst system...” (lines 2-3) since the exhaust gas and space velocity are not elements of the apparatus.

With respect to claim 5, it is unclear as to where the body of the claim begins. Furthermore, “the control of emissions” (line 1), “the exhaust gases” (line 1) and “propane” (line 8) lack proper positive antecedent basis. Furthermore, it is unclear as to where “systems do not include silver or tungsten” (lines 3-4) is disclosed in the specification.

With respect to claims 6 and 7, “the exhaust gas” (line 1) lacks proper positive antecedent basis as it is merely recited in the intended use clause of claim 5, line 1.

With respect to claim 8, “the engine” lacks proper positive antecedent basis as it is merely recited in the intended use clause of claim 5, line 2.

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5. The claims are generally narrative, indefinite and appear to be a literal translation into English from a foreign document, thus rendering the claims difficult to search. It is suggested that the claims be rewritten in order to conform to current U.S. practice.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schlatter et al. (U.S. 4,071,600).

With respect to claim 1, Schlatter et al. disclose a dual bed (column 2, lines 33-43) emissions control system suitable for a lean-burn internal combustion engine (column 2, lines 23-32) comprising a first up-stream catalyst system having a platinum group metal (column 2,

lines 8-12) and a second down-stream catalyst system having a platinum group metal (column 2, lines 18-22) characterized by a % carbon monoxide conversion greater than 70% at a temperature of 300 °C (Fig. 2). The first and second catalyst systems do not include silver or tungsten and further comprise platinum and/or palladium and/or rhodium (column 2, lines 5-22).

However, Schlatter et al. are silent as to the following:

- (i) the first catalyst having a ratio of % NO_x to % hydrocarbon conversion of at least 0.2;
- (ii) the second catalyst having a % hydrocarbon conversion greater than 80%; and
- (iii) performing the catalyst characterization at 230 °C, a space velocity of 25,000 hr⁻¹ and a hydrocarbon: NO_x input ratio of 3:1.

It would have been obvious for one of ordinary skill in the art at the time the invention was made to (i) characterize the first catalyst as having a ratio of % NO_x to % hydrocarbon conversion of at least 0.2 and (ii) characterize the second catalyst as having a % hydrocarbon conversion greater than 80% (both tested under the conditions of a temperature of 230 °C, a space velocity of 25,000 hr⁻¹ and a hydrocarbon: NO_x input ratio of 3:1) because:

(i) although a first catalyst ratio of % NO_x to % hydrocarbon conversion greater than 0.2 is not expressly stated, a newly discovered property does not necessarily mean the product is unobvious, since this property may be inherent in the prior art. *In re Best* 195 USPQ 430 (CCPA 1977); *In re Swinehart* 169 USPQ 226 (CCPA 1971). The catalyst system disclosed by Schlatter et al. comprises substantially the same elements as the claimed invention (comprising a platinum group metal such as platinum, palladium, and/or rhodium and no tungsten or silver; column 2, lines 5-22) and therefore one would not expect a different and/or unexpected result to be obtained.

(ii) although a second catalyst % hydrocarbon conversion of greater than 80% is not expressly stated, a newly discovered property does not necessarily mean the product is unobvious, since this property may be inherent in the prior art. *In re Best* 195 USPQ 430 (CCPA 1977); *In re Swinehart* 169 USPQ 226 (CCPA 1971). The same comments with respect to Schlatter et al. in (i) apply. Furthermore, Schlatter et al. disclose a relationship between increased catalyst loading and increased conversion efficiency of hydrocarbon (column 4, lines 50-62). In particular, Fig. 2 indicates this trend (24% HC conversion at 0.002 wt % Rh versus 74% HC conversion at 0.1 wt % Rh). Thus, it is reasonable that one of ordinary skill in the art could have easily achieved the claimed hydrocarbon conversion by merely increasing the catalyst loading.

(iii) although testing conditions at a temperature of 230 °C, a space velocity of 25,000 hr⁻¹, and a hydrocarbon:NOx input ratio of 3:1 is not expressly stated, it would have been obvious to select an appropriate temperature, space velocity, and input ratio such that a desired catalyst conversion level was obtained since what is recited is merely a testing condition, and where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art, *In re Aller*, 105 USPQ 233. In particular, Schlatter et al. disclose a test temperature of 300 °C, space velocities ranging from 38,000 hr⁻¹ to 85,000 hr⁻¹, and input ratios of typical automotive emissions comprising hydrocarbons and NOx. In addition, it has been held that the substitution of a known hydrocarbon feed for another in hydrocarbon conversion processes involves ordinary skill in the art. *In re Keough* 153 USPQ 409 (CCPA 1967).

With respect to claim 2, Schlatter et al. disclose a system that when connected an engine, an exhaust gas flows over the first catalyst system at a space velocity of below $40,000 \text{ hr}^{-1}$ ($\sim 38,000 \text{ hr}^{-1}$; column 3, lines 36-39).

With respect to claim 3, Schlatter et al. disclose a system that when connected to an engine, an exhaust gas flows over the second catalyst system at a space velocity between $40,000$ and $80,000 \text{ hr}^{-1}$ ($\sim 57,000 \text{ hr}^{-1}$; column 4, lines 10-16).

With respect to claim 5, the same comments with respect to Schlatter et al. apply. Furthermore, Schlatter et al. disclose a process comprising passing a gas stream over the first catalyst system and then passing the stream over the second catalyst system positioned downstream of the first catalyst system (column 2, lines 5-22).

With respect to claim 6, Schlatter et al. disclose passing an exhaust gas flow over the first catalyst system at a space velocity of below $40,000 \text{ hr}^{-1}$ ($\sim 38,000 \text{ hr}^{-1}$; column 3, lines 36-39).

With respect to claim 7, Schlatter et al. disclose passing an exhaust gas flow over the second catalyst system at a space velocity between $40,000$ and $80,000 \text{ hr}^{-1}$ ($\sim 57,000 \text{ hr}^{-1}$; column 4, lines 10-16).

With respect to claim 8, Schlatter et al. disclose the process wherein the engine is in a vehicle (specified industrial applicability to automotive pollutants; column 1, lines 1-18, 39-60).

7. Claims 1 and 4-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al. (U.S. 5,451,388).

With respect to claim 1, Chen et al. disclose a gas treatment system comprising a first catalyst zone **20** of a platinum group metal catalyst and a second catalyst zone **22** positioned downstream of the first catalyst zone (column 4, lines 58-60) also of a platinum group metal catalyst. Chen et al. make no indication that the catalyst systems are to include silver or tungsten and further disclose that the preferred embodiment both systems may comprise platinum and/or palladium (column 3, lines 52-62).

Furthermore, Chen et al. disclose characterization of catalyst performance by testing under a constant space velocity of $30,000 \text{ hr}^{-1}$, a temperature range of 150°C to 450°C , and a constant feed gas composition (column 16, lines 7-25). Chen et al. also disclose the results of the catalyst performance testing in TABLE 1 (column 16, line 34), which illustrate a high conversion efficiency of carbon monoxide (ie. 98 % at 250°C). Furthermore, Chen et al. disclose that a space velocity of $1,000$ to $100,000 \text{ hr}^{-1}$ and more preferably between $5,000$ to about $50,000 \text{ hr}^{-1}$ may be used (column 3, lines 47-51).

However, Chen et al. are silent as to the following:

- (i) the first catalyst having a ratio of % NO_x to % hydrocarbon conversion of at least 0.2;
- (ii) the second catalyst having a % hydrocarbon conversion greater than 80%; and
- (iii) performing the catalyst characterization under a hydrocarbon to NO_x input ratio of 3:1.

It would have been obvious for one of ordinary skill in the art at the time the invention was made to (i) characterize the first catalyst as having a ratio of % NO to % hydrocarbon conversion of at least 0.2 and (ii) characterize the second catalyst as having a % hydrocarbon conversion of greater than 80 % (both tested under (iii) a hydrocarbon: NO_x input ratio of 3:1) in the apparatus of Chen et al. because:

(i) although a first catalyst ratio of % NO_x to % hydrocarbon conversion is not stated, a newly discovered property does not necessarily mean the product is unobvious, since this property may be inherent in the prior art. *In re Best* 195 USPQ 430 (CCPA 1977); *In re Swinehart* 169 USPQ 226 (CCPA 1971). The catalyst system disclosed by Chen et al. comprises substantially the same elements as the claimed invention (comprising a platinum group metal such as platinum, palladium, and/or rhodium and no tungsten or silver; column 9, lines 40-51) and therefore one would not expect a different and/or unexpected result to be obtained.

(ii) although a second catalyst % hydrocarbon conversion of greater than 80% is not stated, a newly discovered property does not necessarily mean the product is unobvious, since this property may be inherent in the prior art. *In re Best* 195 USPQ 430 (CCPA 1977); *In re Swinehart* 169 USPQ 226 (CCPA 1971). The same comments with respect to Chen et al. in (i) apply.

(iii) although a hydrocarbon:NO_x input ratio of 3:1 is not expressly stated, it has been held that the substitution of a known hydrocarbon feed for another in hydrocarbon conversion processes involves ordinary skill in the art. *In re Keough* 153 USPQ 409 (CCPA 1967). Chen et al. disclose that the invention may be used in the treatment of gas streams containing at least one carbonaceous compound (ie. organic compound and/or carbon monoxide) and inorganic gaseous constituents (ie. nitrogen) (column 2, lines 41-51). In addition, it would have been obvious to choose another input ratio such that a desired catalyst conversion level was obtained since what is recited is merely a testing condition, and where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art, *In re Aller*, 105 USPQ 233.

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With respect to claim 4, the same comments with respect to Chen et al. apply. Furthermore, Chen et al. disclose that in the preferred embodiment, the catalytic material may comprise platinum and that the first and second catalytic materials may comprise the same material (column 3, lines 58-62).

With respect to claim 5, the same comments with respect to Chen et al. apply. Furthermore, Chen et al. disclose a process comprising passing a gas stream over the first catalyst system **20** and then passing the stream over the second catalyst system **22** positioned downstream of the first catalyst system (column 3, lines 12-15).

With respect to claims 6 and 7, the same comments with respect to Chen et al. apply. Furthermore, Chen et al. disclose that the gas stream is passed over the system (comprising both the first and second catalyst beds) at a space velocity preferably from about 1,000 to about 100,000 hr⁻¹, and more preferably 5,000 to about 50,000 hr⁻¹ (column 3, lines 47-51). Chen et al. also indicate that a fixed space velocity is merely controlled by adjusting the size of the catalyst bed (column 13, lines 9-19). In any event, it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Oshima et al. and Rudy are provided to illustrate the state of the art.

Twigg et al. (U.S. '141) is provided to illustrate the applicant's related invention.

* * * * *

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer A. Leung whose telephone number is 703-305-4951.

The examiner can normally be reached on 8:30 am - 5:30 pm M-F, every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marian C. Knode can be reached on 703-308-4311. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

JAL
August 23, 2002



Hien Tran
HIEN TRAN
PRIMARY EXAMINER